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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,122	01/12/2006	Jindrich Vosahlo	5724T-000006/NP	9690

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EXAMINER	
BANH, DAVID H	

ART UNIT	PAPER NUMBER
2854	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/520,122	VOSAHLO, JINDRICH	
	Examiner	Art Unit	
	DAVID BANH	2854	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *See Continuation Sheet* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-6,10,12,14,15,25,28,29,33,36,38,40,42,47,50,68,76,78 and 81-83* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/8/10*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims pending in the application are 1,3-6,10,12,14,15,25,28,29,33,36,38,40,42,47,50,68,76,78 and 81-83.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 8, 2010 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 3-6, 10, 12, 14, 15, 25, 28, 29, 33, 36, 38, 40, 42, 47, 50, 68, 76, 78 and 81-83 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3-6, 10, 12, 14, 15, 25, 28, 29, 38, 40, 42, 47, 50 and 81-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wen et al. (US Patent 6,092,890) in view Duong (US Patent 4,411,931).

For claims 1: Wen et al. teaches a method, for use with an inkjet device **10**, of printing an area of a substrate **80** in a plurality of passes (see Fig. 4A and 4B) using

radiation curable ink **110, 120**, the method comprising depositing with the inkjet device **10** a plurality of spaced apart droplets of radiation curable ink **100** onto the substrate **80** in a first pass on the area (see Fig. 4A), curing the ink deposited in the first pass (see Fig. 4A, the ink **110** becomes cured ink **120**), depositing with the inkjet device a second plurality of spaced apart droplets of radiation curable ink onto the substrate in a second pass on the area (see Fig. 4B), the steps of jetting are performed with the inkjet device **10** (see column 2, lines 65-67 and column 3, lines 1-5) in which discrete droplets of ink are deposited from at least one nozzle **31, 32, 33, 34** onto the substrate **80**, the deposition of adjacent droplets of ink **100** are separately controlled to permit mutually different adjacent droplets to be deposited on the substrate **80** (see column 3, lines 60-65, control electronics **25** and computer **20** and Fig. 4A, mutually adjacent but different drops **110** are deposited on the substrate **80**), and fully curing the ink (see Fig. 2, step **250**).

Wen et al. does not teach partially curing the first layer of deposited ink so that the exposed surface of the partially cured ink is in a non-solidified form. However, Duong teaches a method of controlling the surface texture of radiation curable substrate (see Title) wherein the substrate is partially cured with long-wave length light at low intensity (see Abstract, lines 3-7) so that the bottom portion of the material is cured while the top is relatively unaffected before subsequently full curing the material (see Abstract, lines 8-15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to partially cure the ink as taught by Duong for the first

layer of ink of Wen et al. for the purpose of controlling the surface texture of the printed product.

For claim 3: The combination of Wen et al. and Duong teaches the method of claim 1 wherein the partial curing step is such that an exposed surface of the partially cured ink is substantially liquid or gel form (see Duong, column 2, lines 20-25, the exposed surface should be substantially liquid since the radiation has little or no effect on it).

For claim 4: The combination of Wen et al. and Duong teaches the method of claim 1 wherein the partially cured ink is prevented from solidifying by oxygen inhibition (see Duong, column 3, lines 35-37).

For claim 5: The combination of Wen et al. and Duong teaches the method of claim 1 wherein the partial curing step effects at least partial curing of the ink adjacent the substrate (see Duong, Abstract, lines 3-7).

For claim 6: The combination of Wen et al. and Duong teaches the method of claim 1. The partial curing step of Duong is followed by a full cure; therefore, the partially cured ink is made stable after a period of minutes.

For claim 10: The combination of Wen et al. and Duong teaches the method of claim 1 and Duong teaches that the step of curing the ink is effected by a first device and the step of full curing the ink is effected by a second device (see column 3, lines 45-55, bank of long wave length low intensity lights as the first device and standard germicidal lamps as the second device), and the location of the first and second devices is separate from the second device (see column 3, lines 45-55, the devices are different

and therefore cannot be in the literal same place, additionally, the environments for the first and second curing is changed and the substrate is typically advanced in the printing so the location of the devices is necessarily distinct).

For claim 12: The combination of Wen et al. and Duong teaches the method of claim 1 and Wen et al. teaches the use of UV curable ink (column 2, lines 35-40).

For claim 14: The combination of Wen et al. and Duong et al. teaches the method of claim 12 wherein the wavelength of the radiation is greater than 370 nm (see column 3 of Duong, lines 30-35, the range is taught to be about 3000-4200 angstroms which is 300 to 420 nm, and thus the taught range overlaps with the desired range; lower wavelength light is desirable to limit heating of the substrate and conserve energy).

For claim 15: The combination of Wen et al. and Duong et al. teaches the method of claim 1 and Duong teaches the fully curing step comprises providing an inerting environment (see column 3, lines 62-65).

For claim 25: The combination of Wen et al. and Duong et al. teaches the method of claim 1. The ink in the combination after partially curing is still wet and thus can be displaced by rubbing.

For claim 28: The combination of Wen et al. and Duong et al. teaches the method of claim 1 and Wen et al. teaches that the ink of the first pass is substantially wetted (see Figs. 4A and 4B, the ink is covered and thus the wet second pass "wets" the first pass) by the second pass of ink.

For claims 29: Wen et al. teaches a method, for use with an inkjet device **10**, of

printing an area of a substrate **80** in a plurality of passes (see Fig. 4A and 4B) using radiation curable ink **110, 120**, the method comprising depositing with the inkjet device **10** a plurality of spaced apart droplets of radiation curable ink **100** onto the substrate **80** in a first pass on the area (see Fig. 4A), immobilizing the ink deposited in the first pass (see Fig. 4A, the ink **110** becomes cured ink **120**), depositing with the inkjet device a second plurality of spaced apart droplets of radiation curable ink onto the substrate in a second pass on the area (see Fig. 4B), wherein only a minor part of the second pass of ink is deposited on top of the partially cured first pass (see Figs. 4A and 4B, the second pass only touches the edge of the first pass; additionally, note that the liquid second pass can thus wet the first pass).

Wen et al. does not teach that the immobilized first pass of ink is such that the layer of ink adjacent the substrate has a higher viscosity than the viscosity of the exposed surface of the ink. However, Duong teaches a method of controlling the surface texture of radiation curable substrate (see Title) wherein the substrate is partially cured with long-wave length light at low intensity (see Abstract, lines 3-7) so that the bottom portion of the material is cured while the top is relatively unaffected, somewhat cured or gelled portion near the substrate has a higher viscosity than the surface, before subsequently full curing the material (see Abstract, lines 8-15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to partially cure the ink as taught by Duong for the first layer of ink of Wen et al. for the purpose of controlling the surface texture of the printed product.

For claim 38: Wen et al. teaches an apparatus for an inkjet device (see Fig. 1), for use in printing an area of a substrate in a plurality of passes using radiation curable ink (see Fig. 4A-4D, a plurality of passes), comprising a print head **31-34** arranged to deposit a first pass of ink using radiation curable ink on a first sub-area of the area; means for curing **52** the ink **100** deposited on the area, a print head **31-34** arranged to deposit a second pass of ink on a second sub-area adjacent to the first sub-area, wherein only a minor part of the second pass of ink (see Fig. 4A and 4B) is deposited on top of the partially cured ink of the first pass. Wen et al. does not teach separate first partially curing means which is adapted to partially cure the ink such that the Exposed surface of the partially cured ink is in a non-solidified form and that a layer of the partially cured ink adjacent the substrate has a viscosity greater than that of the exposed surface and means for fully curing the ink. However, Duong teaches a method of curing a coating substrate comprising first partial curing means that cures with long-wave length light at low intensity (see Abstract, lines 3-7) so that the bottom portion of the material is cured while the top is relatively unaffected, somewhat cured or gelled portion near the substrate has a higher viscosity than the surface, and second full curing means (see Abstract, lines 8-15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a partial curing means which leaves the surface non-solidified and leaves the ink near the substrate at a higher viscosity than the surface ink with a subsequent fully curing means as taught by Duong et al. for the purpose of controlling the surface texture of the printed ink.

For claim 40: The combination of Wen et al. and Duong et al. teaches the apparatus of claim 38 wherein the means for partially curing the ink is adapted to leave the exposed surface substantially liquid (see Abstract of Duong, lines 3-7).

For claim 42: The combination of Wen et al. and Duong et al. teaches the apparatus of claim 38 wherein the means for partially curing is adapated to partially cure the ink adjacent the substrate (see Abstract of Duong, lines 8-15).

For claim 47: The combination of Wen et al. and Duong teaches the method of claim 38 and Duong further teaches that partial curing of the ink is effected by a first device and the full curing of the ink is effected by a second device (see column 3, lines 45-55, bank of long wave length low intensity lights as the first device and standard germicidal lamps as the second device), and the location of the first and second devices is separate from the second device (see column 3, lines 45-55, the devices are different and therefore cannot be in the literal same place, additionally, the environments for the first and second curing is changed and the substrate is typically advanced in the printing so the location of the devices is necessarily distinct).

For claims 50 and 82: The combination of Wen et al. and Duong et al. teaches the apparatus of claim 38 and the method of claim 1 respectively, and Duong further teaches varying the dose of radiation applied to the region of ink in the partial curing step of vary the level of gloss (see column 2, lines 25-30, the low pressure partial cure causes a desired surface texture).

For claim 81: The combination of Wen et al. and Duong et al. teaches the method of claim 1. For a fixed printing system, if the speed of the printing is changed,

the level of partial cure will change since the substrate will spend more or less time under the lamps.

For claim 83: The combination of Wen et al. and Duong et al. teaches the method of claim 1 and Wen et al. teaches a second pass of ink being printed on the first pass of ink (see Figs. 4A and 4C, considering the pass of 4A the first pass and the pass of 4C the second pass).

5. Claims 33, 36, 68 and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wen et al. (US Patent 6,092,890) and Duong (US Patent 4,411,931) as applied to claim 1 above, and further in view of Cleary et al. (US Patent 6,457,823).

For claims 33 and 76: The combination of Wen et al. and Duong teaches the method of claim 1 and the apparatus of claim 38 and Wen et al. further teaches that the ink is emitted with a printer carriage **45** having one or more print heads **31-34** (see Fig. 1) and the at least partial curing uses a first radiation source which is arranged to move with the print heads (see Fig. 4, first source **50-52**). The combination does not teach first and second devices such that the second device is arranged such that the print heads can move relative to the radiation source. However, Cleary et al. teaches a first radiation source **42** for partially curing an ink jet printed substrate arranged to move with a printer carriage **18** and a second radiation source **200** that is arranged separate from the printer carriage **18** and thus the printer carriage and ink jet heads can be moved relative to it (see Fig. 11).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the second radiation source separate from the printer

carriage for the purpose of reducing the weight of the printer carriage so that printer carriage can be easily moved at a fast speed.

For claims 36 and 68: The combination of Wen et al. and Duong teaches all of the limitations of claims 36 and 68 respectively, except the use of an LED as a source of UV radiation. However, Cleary et al. teaches the use of an LED as a source of UV radiation (see column 2, lines 1-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use LED radiation sources as taught by Cleary et al. for the purpose of increasing efficiency and reducing energy usage.

6. Claim 78 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wen et al. (US Patent 6,092,890), Duong (US Patent 4,411,931) and Cleary et al. (US Patent 6,457,823) as applied to claim 76 above and in further view of Codos (US PG Pub 2002/0024544).

For claim 78: The combination of Wen et al., Duong and Cleary et al. teaches all of the limitations of claim 78 except a beam movable with respect to the area of substrate, the printer carriage being adapted to move along and with the beam wherein the radiation source for fully curing the ink and the beam are relatively movable. However, Codos teaches an ink jet printer (see Fig. 1) comprising a beam **128** that carries a printer carriage **130** that is adapted to move along the beam **128** in direction **113** (see paragraph 21) as well as with the beam **128** in direction **112** (see Fig. 1A, and paragraph 38, at least in one embodiment, the beam is movable with respect to the paper and the carriage moves with the beam, to allow the ink jets to be incremented to produce a higher print quality and resolution). It would have been obvious to one of

ordinary skill in the art at the time the invention was made to provide a beam movably along a length of the substrate with the print head moving along the beam and with the beam as taught by Codos for the purpose of allowing the ink jet to increment against the paper to produce a higher print quality and resolution by having moving the ink jet in a controlled and indexed position relative to the paper. In the combination of Wen et al., Duong, Cleary et al. and Codos, as recited above, the beam is independently movable and separate from the curing station for fully curing **200**, and thus the fully curing means and the beam are relatively movable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID BANH whose telephone number is (571)270-3851. The examiner can normally be reached on M-F 9:30AM - 8PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571)272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DHB

/Judy Nguyen/
Supervisory Patent Examiner, Art Unit 2854